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MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

| EXAMINER | |
|---|---|
| HUANG, DAVID S | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/522,836 | KUIJK, MAARTEN | |
| | Examiner | Art Unit | |
| | DAVID HUANG | 2611 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments, with respect to the objections to claims 1-10 have been fully considered and are persuasive. The objection has been withdrawn.

2. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Objections*

3. **Claims 1-7** are objected to because of the following informalities: Claim 1, line 5, the reference number (46) for circuitry remains when all other reference numbers in the claims have been deleted by the amendment of 12/30/2008. This reference number should be deleted to be consistent in the claims, unless it was applicant's intention to leave this one reference number.

**Claims 2-7** are dependent on objected claim 1.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1, 2, 4, 5, 8 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonu et al. (US 4,531,165) in view of Gaudet (US 6,002,717 - previously cited in the 7/30/2008 action).

Regarding **claims 1 and 8**, Sonu et al. discloses an adaptive equalizer comprising:

an equalizer filter (Fig. 3, block 17) for filtering a distorted signal from a communication channel, having a data signal input for receiving said distorted signal (IN Fig. 4), a feedback signal input (output of counter 53, Fig. 4) for a feedback control signal, and which generates an output signal at an output node (OUT in Fig. 4);

circuitry (46) (blocks 53-60) for processing said output signal and generating said feedback control signal, the circuitry comprising

a first means for measuring a short-term-amplitude signal of said output signal (high pass filter 60, peak detector 58; Fig. 4),

a second means for measuring a long-term-amplitude signal of said output signal (low pass filter 59, peak detector 57; Fig. 4),

a comparator means that compares said short-term-amplitude signal and said long-term-amplitude signal and that determines the evolution of said feedback control signal (summing amplifier 53 and comparator 55 column 4, lines 37-42; Fig. 4), arranged such that said distorted signal is compensated for its higher frequency attenuation in said communication channel (column 3, lines 18-35 and column 4, lines 43-49).

However, Sonu et al. fails to expressly disclose the feedback control signal is analog and that the comparator determines the evolution of said analog feedback control signal during actual data transmission.

Gaudet discloses a similar adaptive equalizer in which an analog feedback signal (output of DAC 81, Fig. 4) is generated from the output of a chain comprising both low frequency and high frequency discriminators, and a comparator. Like Sonu et al., Gaudet discloses that the

analog feedback signal adjusts a gain value, and thus adjusts the amount of frequency compensation applied by the equalizer (col. 12, line 63-col. 13, line 4, Figs. 3 and 4). Gaudet also discloses this equalization filter system filters a signal in response to a feedback signal indicative of the characteristics of the transmission link, but without prior knowledge of either the channel characteristics of the transmission link or the transition density or frequency-amplitude spectrum of the received signal (col. 4, lines 1-7). Thus, it is implicit that the received signal is actual data, since neither the transition density nor the frequency amplitude spectrum is known beforehand. Such a system is advantageous since it filters an actual data signal and performs optimal equalization on the received signal without over- or under-compensation, and is easy and inexpensive to implement (col. 4, lines 54-67).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to modify the equalizer of Sonu et al. with the teaching of Gaudet since it would achieve optimal and accurate equalization without over- or under-compensation while also being easy and inexpensive to implement.

Regarding **claims 2 and 9**, Sonu et al. discloses everything claimed as applied to claim 1, and further discloses the short-term-amplitude signal of the output signal is indicative for the amplitude of the high-speed component of said output signal (column 3, lines 31-35 and column 4, lines 21-22, and 34-36; the high-density portion is associated with the high frequency portion of the signal).

Regarding **claim 4**, Sonu et al. disclose everything claimed as applied to claim 1, and further discloses the short-term-amplitude signal of the output signal is generated by a circuit comprising a high-pass filter; and

a peak detector (high pass filter 60 and peak detector 58, Fig. 4).

Regarding **claim 5**, Sonu et al. disclose everything claimed as applied to claim 1, and further discloses the long-term-amplitude signal of the output signal is generated by a circuit comprising a low-pass filter and a peak detector (low pass filter 59 and peak detector 57, Fig. 4).

6. **Claims 3 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonu et al. (US 4,531,165) in view of Gaudet (US 6,002,717 - previously cited in the 7/30/2008 action) as applied to claims 1 and 8 above, and further in view of Koch et al. (US 4,817,208).

Regarding **claims 3 and 10**, Sonu et al. discloses everything claimed as applied to claim 1, but fails to expressly disclose the long-term-amplitude signal is indicative for the amplitude of the output signal stripped from its possible overshoot peaks.

Nevertheless, Sonu et al. teaches low pass filter 59 is designed to pass the low frequency (low density) portion of the output signal and to attenuate the high frequency (high density) portion of the signal. The attenuation is great enough to ensure that the low density portion of the signal has substantially higher amplitude than the high density portion of the signal at the output of the low pass filter 59 (column 4, lines 18-26, Fig. 4).

Koch et al. discloses a low pass filter removes excess bandwidth from a voltage signal to reduce noise and has approximately constant group delay to minimize pulse overshoot and ringing (column 4, lines 13-17, see Figure).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to specify the low-pass filtered output of Sonu et al. to be indicative for the

amplitude of the output signal stripped from its possible overshoot peaks since Koch et al. teaches that low pass filters are used to reduce noise and minimize pulse overshoot and ringing.

7. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonu et al. (US 4,531,165) in view of Gaudet (US 6,002,717 - previously cited in the 7/30/2008 action) as applied to claim 1 above, and further in view of Gyi (US 3,659,276).

Regarding **claim 6**, Sonu et al. discloses everything claimed as applied to claim 1 above, but fails to expressly disclose said output signal is fed to a limiting amplifier to produce a digital output signal.

Gyi teaches eliminating the effects of signal amplitude variation using an equalizer 21 and limiter-amplifier 22. Limiter-amplifier 22 outputs a rectangular wave which is sent to a differentiator to generate uniform pulses which are precisely spaced according to source data (column 3, lines 32-46, Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the invention was made to provide Sonu et al. with the limiter-amplifier of Gyi since it improves performance by eliminating signal amplitude variation and helps to generate uniform output pulses associated with source data.

8. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonu et al. (US 4,531,165) in view of Gaudet (US 6,002,717 - previously cited in the 7/30/2008 action), as applied to claim 1 above, and further in view of Doyle (US 5,717,716).

Regarding **claim 7**, Sonu et al. discloses everything claimed as applied to claim 1, but fails to expressly disclose an multi-stage adaptive equalizer comprising at least a first and a

second adaptive equalizers such as in claim 1, wherein the output signal of said first adaptive equaliser is fed to the data input node of said second adaptive equaliser.

Doyle discloses a quasi-adaptive equalization network with two cascaded equalizers (Figs. 4 and 5, column 5, lines 29-42). The equalizers can operate in three different modes (column 5, lines 38-42; column 6, lines 47-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a multi-stage adaptive equalizer since this increases adaptability in the equalization system by allowing variations to multiple equalization stages rather than to a single stage.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chao et al. (US 6,047,026) discloses an analog decision feedback equalizer.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID HUANG whose telephone number is (571)270-1798. The examiner can normally be reached on Monday - Friday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSH/dsh
3/29/2009
/David Huang/
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611